Claimed is:

1. An automatic phase and frequency adjust circuit, comprising:

a phase locked loop circuit adapted to generate a phase locked loop clock responsive to a reference signal;

an edge detector circuit adapted to generate an edge pulse signal corresponding to a transition of an analog data signal;

a phase detector circuit adapted to identify a phase of the phase locked loop clock associated to the transition of the analog data and thereby generate a phase adjust signal; and

a phase adjust circuit adapted to generate a pixel clock by adjusting the phase of the phase locked loop clock responsive to the phase adjust signal.

2. The automatic phase and frequency adjust circuit of claim 1 wherein the phase locked loop circuit comprises:

a phase detector adapted to receive the reference signal;

a loop filter coupled to the phase detector;

a voltage controlled oscillator coupled to the loop filter;

a feedback loop adapted to receive the phase locked loop clock and provide a feedback signal responsive to a frequency adjust signal.

3. The automatic phase and frequency adjust circuit of claim 1 wherein the reference signal is a horizontal synchronization signal.

4. The automatic phase and frequency adjust circuit of claim 1 wherein the edge detector is adapted to generate an edge pulse corresponding to the transition of the analog data signal above a predetermined threshold.

5. The automatic phase and frequency adjust circuit of claim 4 wherein the threshold is programmable.

6. The automatic phase and frequency adjust circuit of claim 1 wherein the edge detector is adapted to generate an edge pulse corresponding to a rising, falling, or both rising and falling edges of the analog data signal.

7. The automatic phase and frequency adjust circuit of claim 1 wherein the phase adjust circuit is adapted to adjust the phase of the pixel clock by delaying the reference signal.

8. The automatic phase and frequency adjust circuit of claim 1 wherein the phase adjust circuit is adapted to adjust the phase of the pixel clock by delaying the phase locked loop clock.

9. The automatic phase and frequency adjust circuit of claim 8 wherein the phase adjust circuit comprises:

a clock delay circuit adapted to generate a plurality of delayed clock signals by delaying the phase locked loop clock; and

a multiplexer adapted to select one of the plurality of delayed clock signals as the pixel clock responsive to a phase adjust signal.

10. The automatic phase and frequency adjust circuit of claim 9 wherein the clock delay circuit comprises an n-stage delay locked loop, each stage generating a corresponding delayed clock phase, each delayed clock phase being 360/n degrees out of phase.

11. The automatic phase and frequency adjust circuit of claim 1

wherein the phase adjust circuit generates a plurality of delayed clock signals by delaying the phase locked loop clock; and

wherein the phase detector comprises:

a phase hit detector adapted to generate a plurality of phase hit enable signals corresponding to the plurality of delayed clock signals and assert one of the phase hit enable signals responsive to the edge pulse signal; and

a phase hit counter adapted to count asserted phase hit enable signals for each of the delayed clock signals over a predetermined time.

12. The automatic phase and frequency adjust circuit of claim 11 wherein the predetermined time is a number of image scan lines.

13. The automatic phase and frequency adjust circuit of claim 11 wherein the

phase hit detector comprises:

a plurality of flip-flop circuits corresponding to the plurality of delayed clock signals adapted to generate a corresponding plurality of phase out signals; and

a comparison circuit adapted to comparing the plurality of phase out signals.

14. The automatic phase and frequency adjust circuit of claim 13 wherein the comparison circuit is adapted to compare adjacent phase out signals.

15. The automatic phase and frequency adjust circuit of claim 11 wherein the phase hit counter comprises:

an enable signal adapted to enable counting of asserted phase hit enable signals; and

a clear signal adapted to clear the phase hit counter.

16. The automatic phase and frequency adjust circuit of claim 11 comprising:

a phase count analysis circuit adapted to generate phase and frequency adjust signals by analyzing the count of asserted phase hit enable signals.

17. The automatic phase and frequency adjust circuit of claim 1 comprising an auto calibration circuit adapted to align the analog data signal with the pixel clock.

18. A circuit, comprising:

an edge detector adapted to generate an edge pulse corresponding to a transition of an analog image signal;

a phase adjust circuit adapted to generate a pixel clock signal by adjusting a phase of a clock signal derived from a reference signal responsive to a phase adjust signal; and

a phase detector circuit adapted to generate the phase adjust signal responsive to the edge pulse signal.

19. The circuit of claim 18 wherein the edge detector is adapted to generate the edge pulse signal responsive to a transition of the analog signal greater than a predetermined threshold.

20. The circuit of claim 18 wherein the edge detector is adapted to generate the

edge pulse responsive to a rising, falling, or both rising and falling edges of the analog image signal.

21. The circuit of claim 18 wherein the edge detector comprises a calibration circuit adapted to calibrate the analog image signal with the pixel clock.

22. The circuit of claim 18 wherein the phase adjust circuit is adapted to generate the pixel clock by delaying the reference signal.

23. The circuit of claim 18 wherein the phase adjust circuit comprises:

a delay locked loop adapted to generate a plurality of clock phases by delaying the clock signal derived from the reference signal; and

a multiplexer adapted to select one of the plurality of delayed clock signals as the pixel clock responsive to the phase adjust signal.

24. The circuit of claim 23 wherein the delay locked loop includes n stages, each clock phase being 360/n degrees out of phase.

25. The circuit of claim 18

wherein the phase adjust circuit comprises a clock delay circuit adapted to generate a plurality of clock phases by delaying the clock signal derived from the reference signal;

wherein the phase detector circuit comprises:

a phase hit enable signal corresponding to each of the plurality of clock phases, the phase hit enable signal being asserted responsive to the edge pulse signal;

a count corresponding to each of the plurality of clock phases, the count being indicative of a number of assertions of a corresponding phase hit enable signal over a predetermined time.

26. The circuit of claim 25 wherein the phase detector circuit comprises:

an enable signal adapted to enable the phase detector circuit; and

a clear signal adapted to clear each count.

27. The circuit of claim 25 wherein the predetermined time is a number of image scan lines.

28. The circuit of claim 25 wherein the phase detector circuit is adapted to generate the phase adjust signal by analyzing the count.

29. The circuit of claim 25 comprising a phase locked loop circuit adapted to derive the clock signal from the reference signal responsive to a frequency adjust signal.

30. The circuit of claim 29 wherein the phase detector circuit is adapted to generate the phase and frequency adjust signals by analyzing each count.

31. A method for automatically adjusting a phase and frequency of a pixel clock in a digital image system, comprising:

generating a plurality of clock phases by delaying a clock signal by a plurality of delays;

detecting a transition of an analog image signal;

asserting a clock phase hit by determining which of the clock phases corresponds to the transition;

counting a number of clock phase hits for each of the clock phases; and

a generating a phase and frequency adjust signal as a result of the counting.

32. The method of claim 31 comprising deriving the clock signal from a reference signal responsive to the frequency adjust signal.

33. The method of claim 31 comprising selecting a clock phase as the pixel clock responsive to the phase adjust signal.

34. The method of claim 31 wherein detecting a transition includes detecting a transition of the analog image signal above a predetermined threshold.

35. The method of claim 31 wherein detecting a transition includes detecting a rising, falling, or both rising and falling edges of the analog image signal.

36. The method of claim 31 wherein detecting a transition includes generating an edge pulse responsive to the transition and wherein asserting a clock phase hit includes comparing the edge pulse with each of the clock phase.

37. The method of claim 31 wherein asserting the clock phase hit includes generating a plurality of clock phase hit signals corresponding to the plurality of clock phases and asserting only the clock phase hit signal closest to the transition.

38. The method of claim 31 wherein counting the number includes counting the number of clock phase hits for each of the clock phases over a predetermined time.

39. The method of claim 38 wherein the predetermined time is a number of image scan lines.

40. The method of claim 31 wherein counting includes:

clearing the counting; and

enabling the counting.

41. The method of claim 31 wherein counting includes generating a count for each of the clock phases and wherein counting comprises:

examining the count; and

adjusting the frequency of the pixel clock if the count exceeds a predetermined number.

42. The method of claim 41 wherein adjusting the frequency of the pixel clock comprises:

changing the frequency of the clock signal;

clearing the count;

enabling the count;

repeating the counting, examining, and adjusting if the count exceeds a predetermined number.